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IS : 4388 - 1982

(Reaffirmed 2000)

Indian Standard

**SPECIFICATION FOR
COTTON FABRICS FOR REINFORCEMENT OF
RUBBER HOSES**

(First Revision)

UDC 677·21·064 : 621·643·3 : 678·046·55



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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR COTTON FABRICS FOR REINFORCEMENT OF RUBBER HOSES

(*First Revision*)

Industrial Textiles Sectional Committee, TDC 49

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Indian Standard
SPECIFICATION FOR
COTTON FABRICS FOR REINFORCEMENT OF
RUBBER HOSES
(*First Revision*)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 15 October 1982, after the draft finalized by the Industrial Textiles Sectional Committee had been approved by the Textile Division Council.

0.2 Cotton fabrics conforming to this standard are used for the reinforcement of rubber hoses.

0.3 When this standard was originally published in 1967 assistance was derived from BS 1103 : 1957 'Cotton fabrics for the reinforcement of rubber hose'. This standard is revised on the basis of general manufacturing and trade practices being followed in the country in this field.

0.4 Standards of Weights and Measures Act, 1976, stipulates the use of International System of Units in the country; in order to familiarize the industry with this system the recommended SI units for use in the textile industry are given in Appendix C of the standard.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements of cotton fabrics used in the reinforcement of rubber hoses.

*Rules for rounding off numerical values (revised).

1.2 This standard also gives the constructional particulars of a few popular varieties of hose fabrics for information only.

2. MANUFACTURE

2.1 Yarn — The yarn used in the manufacture of hose fabrics shall be satisfactory in evenness and shall be reasonably free from neps, spinning and doubling defects.

2.2 Cloth — The cloth shall be evenly and firmly woven in plain weave. The cloth when visually examined shall be reasonably free from foreign matter and such defects as knots, 'umps and irregularities of twist in yarn.

3. REQUIREMENTS

3.1 The constructional particulars of hose fabrics shall be as agreed to between the buyer and the seller subject to the following tolerances when tested by the methods shown against them:

<i>Parameters</i>	<i>Tolerances, Percent</i>	<i>Method of Test</i>
Ends	± 2.5	IS : 1963-1981*
Picks	± 5	IS : 1963-1981*
Mass, g/m ²	± 5	IS : 1964-1970†
Thickness	± 10	IS : 7702-1975‡
Length	+ 1 — 0.5	IS : 1954-1969§
Width	± 2	IS : 1954-1969§

3.1.1 The constructional particulars of a few popular varieties are given in Appendix A for information only.

3.2 The breaking load of cotton hose fabrics shall conform to the requirements given in Table 1.

3.3 The hose fabrics shall be starch free when tested by the method given in Appendix B.

*Methods for determination of threads per unit length in woven fabrics (*second revision*).

†Methods for determination of weight per square metre and weight per linear metre of fabrics (*first revision*).

‡Method for determination of thickness of woven and knitted fabrics.

§Methods for determination of length and width of fabrics (*first revision*).

TABLE 1 REQUIREMENTS OF COTTON HOSE FABRICS

(Clause 3.2)

MASS g/m ²	BREAKING LOAD, Min 5.0 × 20.0 cm RAVELLED STRIP	
	Warp N	Weft N
151 to 250	500	500
251 to 350	750	750
351 to 450	1 000	1 000
451 to 550	1 250	1 250
551 to 650	1 500	1 500
651 to 750	1 700	1 750
751 to 850	2 000	2 000
Above 850	2 500	2 500

Method of Test IS : 1964-1970*

IS : 1969-1968†

1 Newton = 0.102 kgf.

*Methods for determination of weight per square metre and weight per linear metre of fabrics (first revision).

†Method for determination of breaking load and elongation at break of woven textile fabrics (first revision).

4. PACKAGING

4.1 The cloth shall be made into light rolls of specified length as agreed to between the buyer and the seller.

5. MARKING

5.1 The rolls shall be marked with the following:

- Name of the material;
- Length and width of the roll;
- Name of the manufacturer, initials or trade-mark, if any; and
- Month and year of manufacture.

5.1.1 *ISI Certification Mark* — The roll may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

6. PACKING

6.1 The rolls shall be tightly wrapped with a layer of polyethylene film and hessian and sewn tightly all over as agreed to between the buyer and the seller. If necessary, additional layers of packing materials may be used to avoid ingress of moisture in transit.

7. SAMPLING

7.1 For ascertaining the conformity in respect of length, width, breaking load, mass, ends and picks, the number of tests and criteria for conformity as given in IS : 3919-1966* shall be followed.

7.2 For ascertaining the conformity in respect of freedom from starch, the number of tests and criteria for conformity as given in IS : 5463-1969† shall be followed.

APPENDIX A*(Clause 3.1.1)***CONSTRUCTIONAL PARTICULARS OF POPULAR VARIETIES OF COTTON HOSE FABRICS**

<i>Variety No.</i>	<i>Approximate Count of Yarn</i>		<i>Ends</i>	<i>Picks</i>	<i>Mass</i>
	<i>Warp</i>	<i>Weft</i>			
(1)	(2)	(3)	(4)	(5)	(6)
			dm	dm	g/m*
1.	2/14 ^s	2/14 ^s	130	130	235
2.	2/10 ^s	2/10 ^s	130	130	330
3.	2/7 ^s	2/7 ^s	102	102	380
4.	2/10 ^s	2/10 ^s	160	160	420
5.	4/10 ^s	4/10 ^s	93	93	480
6.	3/7 ^s	3/7 ^s	93	93	520
7.	5/10 ^s	5/10 ^s	87	87	580
8.	4/7 ^s	4/7 ^s	83	83	620
9.	5/7 ^s	5/7 ^s	75	75	680
10.	7/10 ^s	7/10 ^s	75	75	700
11.	8/10 ^s	8/10 ^s	75	75	800
12.	7/7 ^s	7/7 ^s	75	75	1 000

*Methods for sampling cotton fabrics for determination of physical characteristics.

†Methods for sampling of cotton fabrics for chemical tests.

APPENDIX B

(Clause 3.3)

METHOD FOR DETERMINATION OF FREEDOM FROM STARCH CONTENT

B-1. TEST SPECIMEN

B-1.1 Cut a piece weighing about 10 g from the test sample. Shred the piece into small bits and mix them thoroughly. Draw from the pieces so shredded a test specimen of about 5 g.

B-2. PROCEDURE

B-2.1 Boil the test specimen in about 200 ml of distilled water in a conical flask for about 45 minutes. Cool the contents in the flask. Put a drop of iodine solution on a smaller quantity taken from the flask.

B-3. REPORT

B-3.1 Observe whether there is any appearance of blue colour on adding a drop of iodine solution. Report the material to be starch-free if no blue colour is observed.

APPENDIX C

(Clause 0.4)

RECOMMENDED SI UNITS FOR TEXTILES

SI No.	Characteristic	SI Unit		Application
		Unit(s)	Abbreviation(s)	
(1)	(2)	(3)	(4)	(5)
1.	Length	Millimetre	mm	Fibres
		Millimetre, centimetre	mm, cm	Samples, test specimens (as appropriate)
		Metre	m	Yarns, ropes, cordage, fab- rics

Sl No.	Characteristic	SI Unit		Application
		Unit(s)	Abbreviation(s)	
(1)	(2)	(3)	(4)	(5)
2.	Width	Millimetre Centimetre Millimetre, centimetre	mm cm mm, cm	Narrow fabrics Other fabrics Samples, test specimens (as appropriate) Carpets, druggets, DURRIES (as appropriate)
3.	Thickness	Micrometre (micron) Millimetre	µm mm	Delicate fabrics Other fabrics, carpets, felts
4.	Linear density	Tex Millitex Decitex Kilotex	tex mtex dtex ktex	Yarns Fibres Filaments, fila- ment yarns Slivers, ropes, cordage
5.	Diameter	Micrometre (micron) Millimetre	µm mm	Fibres Yarns, ropes, cordage
6.	Circumference	Millimetre	mm	Ropes, cordage
7.	Threads in fabric:			Woven fabrics (as appro- priate)
a)	Lengthwise	Number per centimetre Number per decimetre	ends/cm ends/dm	
b)	Widthwise	Number per centimetre Number per decimetre	picks/cm picks/dm	

Sl No.	Characteristic	SI Unit		Application
		Unit(s)	Abbreviation(s)	
(1)	(2)	(3)	(4)	(5)
8.	Warp threads in loom	Number per centimetre	ends/cm	Reeds
9.	Stitches in knitted fabric:			Knitted fabrics (as appropriate)
	a) Lengthwise	Courses per centimetre Courses per decimetre	courses/cm courses/dm	
	b) Widthwise	Wales per centimetre Wales per decimetre	wales/cm wales/dm	
10.	Stitch length	Millimetre	mm	Knitted fabrics, made-up items
11.	Mass per unit area	Grams per square metre	g/m ²	Fabrics
12.	Mass per unit length	Grams per metre	g/m	Fabrics
13.	Twist	Turns per centimetre Turns per metre	turns/cm turns/m	Yarns, ropes, cordage (as appropriate)
14.	Test or gauge length	Millimetre, centimetre	mm, cm	Fibre, yarn and fabric specimens (as appropriate)
15.	Breaking load	Millinewton Newton	mN N	Fibres, delicate yarns (individual or skeins) Strong yarns (individual or skeins), ropes, cordage, fabrics

SI No.	Characteristic	SI Unit		Application
		Unit(s)	Abbreviation(s)	
(1)	(2)	(3)	(4)	(5)
16.	Breaking length	Kilometre	km	Yarns
17.	Tenacity	Millinewton per tex	mN/tex	Fibres, yarns (individual or skeins)
18.	Twist factor or twist multiplier	Turns per centimetre $\times$ square root of tex Turns per metre $\times$ square root of tex	$\left. \begin{array}{l} \text{turns/cm} \\ \times \sqrt{\text{tex}} \\ \text{turns/m} \\ \times \sqrt{\text{tex}} \end{array} \right\}$	Yarns (as appropriate)
19.	Bursting strength	Newton per square centimetre	N/cm ²	Fabrics
20.	Tear strength	Millinewton, newton	mN, N	Fabrics (as appropriate)
21.	Pile height	Millimetre	mm	Carpets
22.	Pile density	Mass of pile yarn in grams per square metre per millimetre pile height	g/m ² /mm pile height	Pile carpets
23.	Elastic modulus	Millinewton per tex per unit deformation	mN/tex/unit deformation	Fibres, yarns, strands

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s ²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m ²

INDIAN STANDARDS INSTITUTION

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones : 26 60 21, 27 01 31

Telegrams : Manaksanstha

Regional Offices:

Telephone

Western : Novelty Chambers, Grant Road

BOMBAY 400007

89 65 28

Eastern : 5 Chowringhee Approach

CALCUTTA 700072

27 50 90

Southern : C. I. T. Campus

MADRAS 600113

41 24 42

Northern : B69, Phase VII

S.A.S. NAGAR

8 78 26

(MOHALI) 160051

Branch Offices:

'Pushpak', Nurmohamed Shaikh Marg, Khanpur

AHMADABAD 380001

2 03 91

'F' Block, Unity Bldg, Narasimharaja Square

BANGALORE 560002

22 48 05

Gangotri Complex, Bhadbhada Road, T. T. Nagar

BHOPAL 462003

6 27 10

22E Kalpana Area

BHUBANESHWAR 751014

5 36 27

5-8-56C L. N. Gupta Marg

HYDERABAD 500001

22 10 83

R 14 Yudhister Marg, C Scheme

JAIPUR 302005

6 98 32

117/418 B Sarvodaya Nagar

KANPUR 208005

4 72 92

Patliputra Industrial Estate

PATNA 800013

6 28 08

Hantex Bldg (2nd Floor), Rly Station Road

TRIVANDRUM 695001

32 27